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IN REPLY REFER TO

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BUMED NOTICE 6400

From: Chief, Bureau of Medicine and Surgery
To: Ships and Stations Having Medical Department Personnel

Subj: TELERADIOLOGY BUSINESS RULES

Ref: (a) Manual of the Medical Department, chapter 16, article 16-15

Encl: (1) Teleradiology Service Grids
(2) Teleradiology Service Guidelines

1. Purpose. To establish a core set of business rules to optimize the use of teleradiology (TR).
2. Background. TR involves the electronic transmission of digitized x-ray images from one location to another for interpretation by a radiologist. The purpose is to provide timely expert x-ray interpretation to the remotely located health care provider to facilitate clinical management and thus improve patient care. As a result of successful pilot programs in the 1990's, use of TR by operational forces and isolated land-based facilities has significantly increased over the ensuing years. As the use of TR expands and workload increases, it is a challenge to supply the growing demand for this service. This new technology can be used most effectively by defining the need for service and meeting these needs through the efficient use of available resources. These business rules broadly define standards for access to interpretation, procedures for communication and documentation, and quality assurance processes to deliver the highest quality service to our patients and providers. These guidelines are not a replacement or substitute for the standard operating procedures (SOPs) of the receiving and sending medical facilities.
3. Access to X-ray Interpretation. The Navy Telemedicine Business Office (NTBO), in collaboration with the Navy Diagnostic Imaging and Radiotherapy Board (NAVDIRB), will assign each facility that requests TR services a primary, secondary (back-up), and after-hours site to receive and interpret TR studies. A site for interpretation of CD ROM (CD-R) x-ray images will also be designated. Table 1 of enclosure (1) is an example of an assignment grid. The specific procedures for obtaining interpretations are dependant upon the urgency of the need, whether STAT (immediate), PRIORITY, or ROUTINE. The provider requesting the x-ray interpretation will determine the level of urgency required. Enclosure (2) is an example of guidelines for TR service procedures.
 - a. STAT Interpretation. Upon notification by the site requesting a STAT x-ray interpretation, the TR interpretation site will provide an interpretation by telephone (if possible) and will generate an electronic interpretation within 1 hour of receipt of the x-ray image and notification of the STAT TR request.

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b. PRIORITY Interpretation. Some x-rays do not require a STAT interpretation, but a radiologist's interpretation is desired more urgently than the ROUTINE designation might provide. Images in this category may be transmitted on a daily basis if bandwidth is available. The TR interpretation site will read transmitted images at regularly scheduled intervals and will generate an electronic interpretation within 24 hours of receiving the image.

c. ROUTINE Interpretation. CD-R files can be hand-delivered (in the case of import ships) or mailed (remote shore facility and underway ship) to the military treatment facility for interpretation of images when bandwidth is limited or not available for routine studies. The site requesting interpretation will transfer digitized x-rays to a CD-R on a weekly or biweekly schedule, depending on volume, urgency, and mail routing availability. To avoid duplication, send only files that have not been previously transmitted for PRIORITY or STAT interpretations. The interpretation site will send an electronic report or mail a paper report within 1 week of receipt of the x-ray studies.

4. Communication. Effective communication between the NTBO, the transmitting referral sites, and the consultation sites is crucial to the successful deployment of TR. Specific information on how to access resources, including telephone numbers, e-mail addresses, points of contact (POC) and Internet interfaces, must be readily available to all participants. A master list shall be updated and centrally maintained on the NTBO Web site, and each requesting and interpretation site will maintain current information for its designated facilities. Table 2 of enclosure (1) is an example of a communication grid.

5. Documentation. Appropriate documentation includes providing timely permanent reports for the individual patient medical record, local temporary image back-up, permanent storage (archive) of the digital (filmless) x-ray images, and accurate workload capture. Documentation guidelines are provided in reference (a).

a. Reports. The site providing the interpretation will generate a report for permanent documentation in the patient's medical record. The facility receiving the TR service is responsible for assuring a report is returned for every image. The requesting and interpreting sites shall coordinate business rules to ensure the reports are delivered electronically or by regular mail, depending on the capabilities and/or limitations of the communicating medical sites.

b. Archives. The site that provides the x-ray interpretation shall provide for the permanent archive function either onsite or at a designated central Digital Imaging Network - Picture Archive Communication System location. The site requesting x-ray interpretation shall back-up the image locally until a report has been received and recorded in the patient's medical record.

c. Workload. Each site that interprets digital x-ray images shall develop, document, and implement a process to capture the TR workload.

6. Quality Processes. The interpretation site, the site requesting service, the NTBO and the NAVDIRB will all contribute to the assurance of quality in the provision of TR services.

a. Interpretation Site. The interpretation site shall establish an SOP to monitor and assure:

- (1) The quality of the image received.
- (2) The quality of the generated report.
- (3) Return of the report is timely.
- (4) The archive system is properly maintained.

Note: Problems encountered related to the quality of the image received should be addressed with the site of x-ray origin. If not resolved, assistance from NTBO will be requested.

b. Requesting Site. The site requesting TR services shall establish an SOP to:

- (1) Monitor x-ray quality.
- (2) Ensure timely delivery of images to the interpretation site by electronic direct transmission or CD-R removable media.
- (3) Maintain temporary back-up libraries until the interpretation site has received the image and returned the final report.
- (4) Enter the final report into the patient's medical record.

Note: Problems with software and hardware will be addressed with the Telemedicine Technical Support Center of the NTBO. Problems with service will be addressed initially with the TR coordinator at the consultation site and then with the NTBO POC if problems persist.

c. NTBO. The NTBO:

- (1) Provides technical support for the hardware and software required for the Navy's Computed Radiography (CR)/TR system.
- (2) Addresses image quality and service issues raised by the TR sites and not resolved with direct interaction between the sending and receiving sites.
- (3) Designates the medical treatment facility (MTF) responsible for providing x-ray interpretation for requesting sites in consultation with the NAVDIRB.

d. NAVDIRB. The NAVDIRB:

- (1) Has oversight responsibility for technical requirements and use of the CR/TR system.
- (2) Monitors the Quality Control programs for both requesting and interpretation sites.

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7. Cancellation Contingency. Cancelled upon incorporation into the Manual of the Medical Department.



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Deputy

Available at: <http://navymedicine.med.navy.mil/instructions/external/external.htm>

TELERADIOLOGY SERVICES AND DATA FLOW

Requesting Site	Primary TR Site	Secondary TR Site	After Hours TR Site	CD-R Site	Permanent Archive Site
Site A	MTF A	MTF B	MTF A	MTF A	NNMC
Site B	MTF B	MTF A	MTF B	MTF C	NNMC
Site C	MTF A	MTF B	MTF A	MTF A	NMCSD
Site D	MTF D	MTF A	MTF D	MTF D	NMCSD
Site E	MTF E	MTF B	MTF B	MTF E	NNMC
Etc.	Etc.	Etc.	Etc.		Etc.

Table 1

TELERADIOLOGY CONTACTS

Site	Telephone	Pager	E-mail	Internet	POC
NNMC	301-295-xxxx	Xxxx	Xxxxx	Xxxxx	CDR xxxx
NMCSD	“	“	“	“	“
NTBO	“	“	“	“	“
NNMC TM Office	“	“	“	“	“
NNMCSD TM Office	“	“	“	“	“
ETC.	Etc.	Etc.	Etc.	Etc.	Etc.

Table 2

TELERADIOLOGY BUSINESS RULES
GREEN COAST SHIPS

1. ROUTINE X-ray Interpretation. Transfer digitized x-rays to a CD-R on a weekly or biweekly schedule, depending on volume, urgency, and mail routing availability. Transfer with "lossless" compression and not a "lossy" JPEG mode. Make one copy to send and a back-up archive copy.

- a. Underway Procedures. Send digitized x-rays via U.S. Mail to:

Attention: Teleradiology Services
Department of Radiology
Green Coast Naval Medical Center (GCNMC)
8901 Green Coast Avenue
Green Coast, USA 12345-5600

The studies will be interpreted and a report generated within 1 week of the CD-R receipt. The report will be returned electronically to the designated e-mail account.

b. Import Procedures. During normal working hours, hand deliver the CD-R studies directly to the GCNMC Radiology Department liaison. The ship's medical personnel will enter patient and study information into CHCS. The GCNMC will provide training and access codes if needed. The ship will print copies from CHCS and place the reports in the medical record.

2. PRIORITY X-ray Interpretation

a. Send as "lossy" compressed x-ray image(s) [QF 80 or 90], transmit via DICOM 3.0 to GCNMC.

b. The film(s) will be interpreted and a report returned by e-mail within 24 hours of file receipt.

3. STAT X-ray Interpretation

a. Send as "lossy" compressed x-ray image(s) [QF 80 or 90], transmit via DICOM 3.0 to GCNMC.

b. Call the duty radiologist at 123-456-7890 or the TR office at 123-456-7890 to request a STAT interpretation. If telephone access is not available, attempt a Web site at _____.

c. The duty radiologist will interpret the x-ray(s), enter an electronic report and, when possible, return a report by telephone within 1 hour of file receipt.